BEST AVAILABLE IMAGES

Defective images within this document are accurate representations of the original documents submitted by the applicant.

Defects in the images may include (but are not limited to):

- BLACK BORDERS
- TEXT CUT OFF AT TOP, BOTTOM OR SIDES
- FADED TEXT
- ILLEGIBLE TEXT
- SKEWED/SLANTED IMAGES
- COLORED PHOTOS
- BLACK OR VERY BLACK AND WHITE DARK PHOTOS
- GRAY SCALE DOCUMENTS

IMAGES ARE BEST AVAILABLE COPY.

As rescanning documents *will not* correct images, please do not report the images to the Image Problem Mailbox.

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER OF PATENTS AND TRADEMARKS
Washington, D.C. 20231
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/761,486	01/16/2001	Wen-Chih Chiou	67,200-306	6239

7590 10/04/2002

TUNG & ASSOCIATES
Suite 120
838 W. Long Lake Road
Bloomfield Hills, MI 48302

EXAMINER	
MARKHAM, WESLEY D	
ART UNIT	PAPER NUMBER
1762	

DATE MAILED: 10/04/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Advisory Action	Application No.	Applicant(s)	
	09/761,486	CHIOU ET AL.	
	Examiner	Art Unit	
	Wesley D Markham	1762	

--Th MAILING DATE of this c mmunication app ars on the cover she t with th correspondenc address --

THE REPLY FILED 30 September 2002 FAILS TO PLACE THIS APPLICATION IN CONDITION FOR ALLOWANCE. Therefore, further action by the applicant is required to avoid abandonment of this application. A proper reply to a final rejection under 37 CFR 1.113 may only be either: (1) a timely filed amendment which places the application in condition for allowance; (2) a timely filed Notice of Appeal (with appeal fee); or (3) a timely filed Request for Continued Examination (RCE) in compliance with 37 CFR 1.114.

PERIOD FOR REPLY [check either a) or b)]

a) ☐ The period for reply expires _____months from the mailing date of the final rejection.

b) ☒ The period for reply expires on: (1) the mailing date of this Advisory Action, or (2) the date set forth in the final rejection, whichever is later. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of the final rejection.
ONLY CHECK THIS BOX WHEN THE FIRST REPLY WAS FILED WITHIN TWO MONTHS OF THE FINAL REJECTION. See MPEP 706.07(f).

Extensions of time may be obtained under 37 CFR 1.136(a). The date on which the petition under 37 CFR 1.136(a) and the appropriate extension fee have been filed is the date for purposes of determining the period of extension and the corresponding amount of the fee. The appropriate extension fee under 37 CFR 1.17(a) is calculated from: (1) the expiration date of the shortened statutory period for reply originally set in the final Office action; or (2) as set forth in (b) above, if checked. Any reply received by the Office later than three months after the mailing date of the final rejection, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

1. ☐ A Notice of Appeal was filed on _____. Appellant's Brief must be filed within the period set forth in 37 CFR 1.192(a), or any extension thereof (37 CFR 1.191(d)), to avoid dismissal of the appeal.

2. ☒ The proposed amendment(s) will not be entered because:

   (a) ☒ they raise new issues that would require further consideration and/or search (see NOTE below);

   (b) ☐ they raise the issue of new matter (see Note below);

   (c) ☒ they are not deemed to place the application in better form for appeal by materially reducing or simplifying the issues for appeal; and/or

   (d) ☐ they present additional claims without canceling a corresponding number of finally rejected claims.

   NOTE: *see attached Office Action*.

3. ☐ Applicant's reply has overcome the following rejection(s): _____.

4. ☐ Newly proposed or amended claim(s) _____ would be allowable if submitted in a separate, timely filed amendment canceling the non-allowable claim(s).

5. ☐ The a)☐ affidavit, b)☐ exhibit, or c)☐ request for reconsideration has been considered but does NOT place the application in condition for allowance because: _____.

6. ☐ The affidavit or exhibit will NOT be considered because it is not directed SOLELY to issues which were newly raised by the Examiner in the final rejection.

7. ☒ For purposes of Appeal, the proposed amendment(s) a)☒ will not be entered or b)☐ will be entered and an explanation of how the new or amended claims would be rejected is provided below or appended.

   The status of the claim(s) is (or will be) as follows:

   Claim(s) allowed: _____.

   Claim(s) objected to: _____.

   Claim(s) rejected: *1-17*.

   Claim(s) withdrawn from consideration: _____.

8. ☒ The proposed drawing correction filed on *30 September 2002* is a)☒ approved or b)☐ disapproved by the Examiner.

9. ☐ Note the attached Information Disclosure Statement(s)(PTO-1449) Paper No(s). _____.

10. ☐ Other: _____

WDM

DETAILED ACTION / ADVISORY ACTION

Response to Amendment

1. Acknowledgement is made of applicant's proposed amendment C, filed as paper #7 on 9/30/2002, in which the applicant proposed to amend Figures 4 and 5, cancel Claims 3, 4, and 8, and amend Claims 1, 2, 12, 13, and 17. However, this amendment has not been entered because it raises new issues that would require further searching and/or consideration. Specifically, applicant's proposed independent Claim 1 would now require that the deposited dielectric ARC be either SiO_2 or SiONH. Proposed independent Claim 1 would also require annealing the dielectric ARC at a temperature of at least 400° C instead of at least 500° C. In addition, proposed independent Claim 1 would no longer require that the annealing be in a gas comprising at least one element selected from N_2 and O_2 (i.e., the claim would be open to annealing in <u>any</u> gas). Proposed Claim 2 would now require that the dielectric ARC layer be SiONH. Proposed independent Claim 13 would now require that the deposited dielectric ARC be either SiO_2 or SiONH. Proposed independent Claim 13 would also require annealing the dielectric ARC at a temperature of at least 400° C instead of at least 500° C. Proposed Claim 17 would require heating the substrate to between 400° C and 700° C instead of between 500° C and 700° C. The aforementioned proposed claim limitations, alone and in combination, significantly alter the scope of the claims and therefore raise new issues that would require further searching and/or consideration. As such, the applicant's proposed amendment C has not been entered.

Response to Arguments

2. Applicant's arguments filed on 9/30/2002 have been fully considered but they are not persuasive. Specifically, the majority of the applicant's arguments are drawn to the claims as proposed in amendment C. However, as this amendment has not been entered for the reasons set forth above in paragraph 1, the arguments regarding the claims as proposed by the applicant in amendment C are moot.
3. In response to applicant's arguments against the references individually (specifically the Abernathey et al. reference – see page 7 of the applicant's remarks), one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).
4. Second, the applicant argues that the Abernathey et al. process is used for a completely different purpose than Plat et al.'s process, and as such, there can be no motivation to combine the two references. In response, the examiner disagrees. Both Abernathey et al. and Plat et al. teach annealing an SiON layer in oxygen gas in order to densify the layer in a semiconductor application. In addition, the motivation for combining the references is clearly set forth in paragraph 12 of the previous Office Action.
5. Third, the applicant appears to argue the criticality of the process step of depositing a dielectric ARC layer on the SiNx or polysilicon layer. For support, the applicant

cites the specification at page 3, line 8 through page 4, line 1. In response, the cited portion of the specification has been reviewed by the examiner. The examiner notes that the cited portion of the specification appears to teach the benefits of utilizing a dielectric ARC (SiO_2, SiON, or SiONH) instead of an organic ARC or inorganic ARC such as TiN or TiW. It does not show or suggest any criticality of either a polysilicon layer or a silicon nitride layer. Briefly, both Holscher et al. and Plat et al. are drawn to utilizing dielectric ARCs as disclosed and claimed by the applicant, not organic ARCs or inorganic ARCs such as TiN or TiW. Both are concerned with providing an effective ARC layer that can be utilized to suppress reflected radiation in later photoresist patterning procedures. Importantly, Holscher et al. teach that the semiconductive substrate on which the ARC layer is deposited includes a semiconductor wafer alone as well as assemblies comprising other materials thereon (Col.2, lines 46 – 55). Plat et al. indicate that a polysilicon layer is conventionally used on top of a semiconductor wafer in semiconductor photoresist patterning processes such as the process of Holscher et al. As such and in view of the combined teachings of Holscher et al. and Plat et al., one of ordinary skill in the art would have clearly recognized that an "assembly" of Holscher et al. would have included a semiconductive substrate with a polysilicon layer deposited thereon. In addition, in response to the applicant's statement that neither Holscher nor Plat recognizes the criticality of a dielectric ARC layer on a surface of SiNx or polysilicon, the examiner strongly disagrees. Plat et al. explicitly teach that, in conventional semiconductor devices, an ARC layer is deposited on top of a polysilicon layer to

reduce reflections that occur during a subsequent photolithography step (Col.1, lines 21 – 35, and Col.2, lines 25 – 30 and 47 – 49). This is exactly the same reason the applicant deposits the ARC layer of their invention (see page 3, line 8 to page 4, line 1 of the applicant's specification).

6. In response to the applicant's statement that neither Holscher nor Plat teaches the coating of a dielectric ARC layer of SiO_2 or SiONH, the examiner disagrees. Holscher et al. do teach an ARC layer of SiONH (Col.2, lines 56 – 67).

Conclusion

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Wesley D Markham whose telephone number is (703) 308-7557. The examiner can normally be reached on Monday - Friday, 8:00 AM to 4:30 PM.

8. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Shrive Beck can be reached on (703) 308-2333. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9310 for regular communications and (703) 872-9311 for After Final communications.

9. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.

Wesley D Markham
Examiner
Art Unit 1762

WDM
October 2, 2002

TIMOTHY MEEKS
PRIMARY EXAMINER